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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/803,541	03/17/2004	Gary Brodsky	2848-53	6260

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EXAMINER	
DESAI, ANAND U	
ART UNIT	PAPER NUMBER
1656	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	01/30/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/803,541	BRODSKY, GARY	
	Examiner	Art Unit	
	Anand U. Desai, Ph.D.	1656	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *03 November 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-8,14,23,42-48,50-52 and 58-60* is/are pending in the application.

4a) Of the above claim(s) *23 and 42-45* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-8, 14, 46-48, 50-52, 58-60* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. This office action is in response to Amendment filed on November 3, 2006. Claims 15-22, 24-41, 49, and 53-57 have been cancelled. New claims 58-60 have been added. Claims 1-8, 14, 46-48, 50-52, and 58-60 are currently pending and are under examination. Claims 23, and 42-45 were previously withdrawn.

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim Rejections - 35 USC § 112, Second Paragraph

3. Claims 1-8, 14, 46, and 58 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

4. The claims are drawn to a peptide "consisting essentially of" an amino acid sequence. Applicants one embodiment in the specification and further clarified in the response to the office action mailed October 19, 2005, state the peptide would have from at least one, and up to about 20, additional heterologous amino acids flanking each of the C- and/or N-terminal ends of the specified amino acid sequence (see paragraph [0107]), but it is unclear if "consisting essentially of" would encompass other embodiments, such as peptides comprising the particular amino acid sequences? Further clarification is requested as to what is encompassed by "consisting essentially of" a SEQ ID NO? Is the particular embodiment the only embodiment?

Claim Rejections - 35 USC § 112, 1st Paragraph, enablement

5. Claims 1-8, 14, 46-48, 50-52, and 58-60 are rejected under 35 U.S.C. § 112, first paragraph, because the specification, while being enabled for a composition comprising prelamin A (SEQ ID NO: 4) or the prelamin A peptides with the singular modification that affects the formation of normal nuclear lamina structures, and the differentiation of cardiac and skeletal myoblast, does not reasonably provide enablement for isolated complexes comprising **fragments, peptides that differ by at least one substitution, deletion, or insertion, and peptides that are at least 70% identical of SEQ ID NO: 2, and SEQ ID NO: 4** that would affect the formation of normal nuclear lamina structures, and induction of myoblast activation and differentiation.

6. The scope of enablement rejection was disclosed in the office action mailed October 19, 2005.

Response to Remarks

Applicants' state the specification describes the biological activity of SEQ ID NO: 2, as well as peptides that consist essentially of such peptide and the claimed variants thereof. Applicants cite page 12, lines 5-9, page 13, lines 21-24, page 18, lines 6-14, and page 21, lines 12-20 to describe the function of prelamin A prepeptide. Applicants' submit a declaration under 37 C.F.R. 1.132 by inventor Gary Brodsky to provide additional supporting evidence that prelamin A prepeptide represented by SEQ ID NO: 2 and a peptide represented by SEQ ID NO: 17 (chicken prelamin A prepeptide; about 53% identical to SEQ ID NO: 2) promotes myoblast fusion, myocyte activation, myocyte differentiation, and myocyte organization in myoblasts.

Applicants' state the experiments with chicken prelamin A prepeptide, which have substitutions at each of positions 1, 4, 5, 6, 9, 11, and 14, as well as two insertions between residues 12 and 13 as compared to SEQ ID NO: 2 (human prelamin A prepeptide) demonstrate that one of skill in the art could readily make and use fragments and modified versions of SEQ ID NO: 2.

Applicant's arguments filed November 3, 2006 have been fully considered but they are not persuasive. The cited pages of the specification do not make and use any modified prelamin A prepeptide in assays to identify a function for SEQ ID NO: 2, rather the specification sections cited make assumptions based on analogy to a yeast protein, or conclusions based on the use of prelamin A (SEQ ID NO: 4) that is subsequently processed to produce the functional effect on myoblasts and myoctyes, such as effecting the nuclear envelope morphology of myotubes.

The declaration under 37 CFR 1.132 filed November 3, 2006 is insufficient to overcome the rejection of claims 1-8, 14, 46-48, 50-52, and 58-60 based upon 35 U.S.C. 112, 1st paragraph, scope of enablement as set forth in the last Office action because: The declaration describes experiments using human prelamin A pre peptide (SEQ ID NO: 2) that has been farnesylated and carboxymethylated to treat mitotically dividing C2C12 myoblasts and H9c2 rat cardiac myoblasts. The results after 48 hours of treatment with the covalently modified C-terminal prelamin A peptide signal suggests the modified peptide can signal cardiac and skeletal myoblast differentiation. Paragraph 5 of the declaration describes the use of chicken prelamin A (SEQ ID NO: 17) in proliferating C2C12 cells to demonstrate that chicken prelamin A peptide functions analogously to the human prelamin A peptide as an extracellular signal for myoblast differentiation. The results describe the differentiation of C2C12 cells after 20 hours of treatment.

Applicants 2nd to last sentence in paragraph 4 states peptide-treated H9c2 cells show modest increases in lamin A/C and prelamin A expression, which is consistent with results indicating that processing of prelamin A and lamin A pools is necessary for myoblast differentiation, therefore it is not certain from the data of the declaration that myoblast differentiation would not proceed due to the increased expression of prelamin A pool. The assay presented in the declaration does not differentiate the effects of prelamin A or lamin A from the prepeptide of prelamin A, and it is known that expression of prelamin A increase the activity of prelamin A endoprotease (see Kilic et al. FEBS (1997)). Therefore, based on the increased expression of the prelamin A endoprotease, the myoblast differentiation could be due to the increased expression of processed prelamin A without the prepeptide segment.

Claim Rejections - 35 USC § 112, 1st Paragraph, written description

7. Claims 1-5, 7, 8, 14, 46, 47, 48, 50, 51, and 58-60 are rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter, which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

8. The written description rejection was disclosed in the office action mailed October 19, 2005.

Response to Remarks

Applicants' submit the specification provides detailed guidance regarding which amino acids in the polypeptides can be altered without affecting the function of the specific

polypeptide. Applicants have amended claim 14 to claim variants of SEQ ID NO: 4 with 95% identity and prelamin A or lamin A biological activity, and fragments that are at least 600 amino acids of SEQ ID NO: 4, wherein the fragment has prelamin A or lamin A biological activity. Applicants' state the specification describes the biological activity of SEQ ID NO: 2, as well as peptides that consist essentially of such peptide and the claimed variants thereof. Applicants refer to the enablement response and the declaration with regard to further support the function of SEQ ID NO: 2. Applicants cite page 34, line 17 to page 37, line 2 to describe which positions of the 15 amino acids of SEQ ID NO: 2 are candidates for modification, based on sequence homology with other animal species.

Applicant's arguments filed November 3, 2006 have been fully considered but they are not persuasive. The cited pages of the specification do not use any modified prelamin A prepeptide in assays to identify a function for SEQ ID NO: 2, rather the specification sections cited make assumptions based on analogy to other animal species to determine altered amino acid residues in the prepeptide fragment of prelamin A.

The declaration under 37 CFR 1.132 filed November 3, 2006 is insufficient to overcome the rejection of claims 1-5, 7, 8, 14, 46, 47, 48, 50, 51, and 58-60 based upon 35 U.S.C. 112, 1st paragraph, written description as set forth in the last Office action because: The assay presented in the declaration does not differentiate the effects of prelamin A or lamin A from the prepeptide of prelamin A, and therefore, the myoblast differentiation could be due to the increased expression of processed prelamin A without the prepeptide segment (see response to enablement rejection above). It is not described as to what is the biological activity of SEQ ID NO: 2.

In regards to claims drawn to prelamin A (SEQ ID NO: 4), the specification does provide guidance to make prelamin A peptides with single substitutions, wherein the modification encompasses Arg60Gly, Leu85Arg, Arg89Leu, Asn195Lys, Glu203Gly, and Arg377His as disclosed, but the specification does not describe the genus of prelamin A peptides with any amino acid substitutions in the residues as currently claimed that retain prelamin A or lamin A biological activity. The specification suggests the disorganization of lamin in the nuclear envelope upon expression of the particular single substitutions cited above. Which species of modifications will retain what prelamin A or lamin A biological activity?

The MPEP 2163 states that the purpose of the written description requirement is to ensure that the inventor had possession, at the time the invention was made, of the specific subject matter claimed. To satisfy the written description requirement, a patent specification must describe the claimed invention in sufficient detail that one skilled in the art can reasonably conclude that the inventor had possession of the claimed invention. See, e.g., > *Moba, B.V. v. Diamond Automation, Inc.*, 325 F.3d 1306, 1319, 66 USPQ2d 1429, 1438 (Fed. Cir. 2003);< *Vas-Cath, Inc. v. Mahurkar,* 935 F.2d at 1563, 19 USPQ2d at 1116. Another objective is to put the public in possession of what the applicant claims as the invention. See *Regents of the University of California v. Eli Lilly,* 119 F.3d 1559, 1566, 43 USPQ2d 1398, 1404 (Fed. Cir. 1997), cert. denied, 523 U.S. 1089 (1998).

The description requirement of the patent statue requires a description of an invention, not an indication of a result that one might achieve if one made that invention. See *In re Wilder*, 736, F.2d 1516, 1521, 222 USPQ 369, 372-73 (Fed. Cir. 1984) (affirming rejection because the

specification does "little more than outlin[e] goals appellants hope the claimed invention achieves and the problems the invention will hopefully ameliorate.")

Accordingly, it is deemed that the specification fails to provide adequate written description for the genus of the modified peptide as currently claims, and does not reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the entire scope of the claimed invention.

Claim Rejections - 35 USC § 102

9. For the purpose of applying art, the phrase, "consisting essentially of" is reasonably interpreted as "comprising" a sequence. Applicant is referred to the previous and pending 112, 2nd rejection requesting clarification of what is encompassed by the phrase when describing sequences.

10. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

11. Claims 1-8, 46, 58, and 59 are rejected under 35 U.S.C. 102(b) as being anticipated by Kilic, F. et al. (Journal of Biological Chemistry, 272(8): 5298-5304 (1997); Cited in 10/19/2005 office action).

Kilic, F. et al. disclose the solid phase synthesis of a peptide that has the sequence, H_2N-RSYLLGNSSPRTQSPQNC-OCH_3 (see Experimental Procedures, page 5299, Peptide Synthesis section). The isolated peptide consists essentially of SEQ ID NO: 2. The peptide has 100% identity with SEQ ID NO: 2, with the insertion of three amino acids, RSY, at the amino terminus. The prelamin A peptide is farnesylated and geranylgeranylated (see Experimental Procedures, page 5299, 2nd and 3rd paragraph of Peptide Synthesis section, and Figure 2, current application, claims 1-8).

12. Claims 14, and 60 are rejected under 35 U.S.C. 102(e) as being anticipated by Eriksson et al. (U.S. 2005/0059071 A1).

Erkisson et al. describes a substantially purified human Lamin A protein as set forth in SEQ ID NO: 7. SEQ ID NO: 7 is 100% identical to SEQ ID NO: 4 from amino acid residues 1 to 606 (see SEQ ID NO: 7, and claim 24).

Conclusion

13. No claims are allowed.

14. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period

will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anand U. Desai, Ph.D. whose telephone number is (571) 272-0947. The examiner can normally be reached on Monday - Friday 9:00 a.m. - 5:30 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dr. Kathleen Kerr Bragdon can be reached on (517) 272-0931. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

January 19, 2007

ROBERT A. WAX
PRIMARY EXAMINER